Septic Tank Absorption System Design Aid and Site Suitability Evaluation Tool for South Carolina Coastal Soils

Project Completion Report

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Introduction

A study was performed to develop a graphical aid that can be used in the design and evaluation of septic tank absorption trenches located in the coastal counties of South Carolina. The product design aid can be used to assess site suitability for the placement of conventional septic tank absorption trenches, as a diagnostic tool to explain the failure of existing systems, as a design tool to size new systems, and, very importantly, as a basis to examine absorption field standards. Simulation results, obtained with the SWMS_2D model for water movement through variably saturated media (Šimunek, et al., 1994), were used to develop the design aid, which relates mound growth over aquifers of known thickness to a dimensionless loading rate parameter, evaluated as the ratio of absorption trench loading rate to soil saturated hydraulic conductivity. This report presents the design aid and supporting information, and illustrates their use with examples.

The focus of this study was septic tank placement in the coastal counties of South Carolina. The soil hydraulic and physical parameters used during the simulations were based on an extensive data set assembled by the U.S. Department of Agriculture (Rawls and Brakensiek, 1989). Those parameter values compared closely to the values obtained for soils sampled at various locations along the South Carolina coast as part of this study. No soils were sampled outside of the coastal counties. Accordingly, the design aid presented in this document is intended for use only in the coastal counties of South Carolina. It should not be used elsewhere without suitable testing. Furthermore, it is a first generation design aid and is subject to change.

Background

Septic tank systems are widely used in South Carolina, particularly along the coast, for the treatment and disposal of domestic wastewater in areas where public sewer systems are not available. When properly designed and maintained, they are an acceptable means for treatment and disposal of these wastes. However, if they fail to perform effectively, they pose a threat to public health and can adversely impact the environment. Septic tank system failure can result from improper design, improper installation, installation in unsuitable soils, or inadequate maintenance. Two of these sources of failure, i..e., improper design and installation in unsuitable soils, can be avoided if site suitability is evaluated properly and the system is sized using the correct loading rate.

Minimum site condition requirements are specified in South Carolina Department of Health and Environmental Control Regulation 61-56 Individual Waste Disposal Systems (SCDHEC, 1986a). Section V.B requires that the "maximum seasonal high water table elevation shall not be less than six (6) inches below the bottom of the proposed soil absorption trenches or alternate system." This *six-inch rule* means the minimum required vertical separation between the bottom of the trench and seasonal high water table is six inches. Most states have greater separation requirements. North Carolina requires 12 inches, except in sandy soils, where the requirement is 18 inches. Delaware requires 36 inches for similar soils. In a North Carolina study of barrier island soils, Cogger, et al. (1988) determined 12 inches is inadequate and that the minimum separation should be 24 inches. The United States Environmental Protection Agency recommends at least 24 to 48 inches vertical separation (USEPA, 1980).

Absorption trenches are sized based on average daily flow rates and ultimate loading rates for the soil type. The Soil Texture Loading Rate Standards (SCDHEC, 1986b) serve as the basis for sizing conventional and modified septic tank absorption trench systems in South Carolina. These standards establish a sliding scale for determining loading rate according to soil texture, as shown in Table 1. The maximum loading rate is based on an ultimate infiltration rate through the biomat of 5 cm/day or 1.23 gpd/ft^2. The most permeable soil (sand) is assigned a maximum loading rate of 1.2 gpd/ft^2 and as clay content increases, the loading rate decreases to 0.1 gpd/ft^2, the ultimate loading rate for silty clay with weak structure. Loading rate standards for soil classes I, II, III, and IV are summarized in Table.1.

Table 1
Soil Texture Loading Rate Standards for Individual Sewage Disposal Systems
Source: DHEC/BES/GS/6-83

SCDHEC Class	USDA Soil Texture	Loading Rate (gpd/ft^2)
Class I	Sand Loamy Sand	0.9-1.2
Class II	Sandy Loam Loam	0.7-0.8
Class III	Silt Loam Sandy Clay Loam Clay Loam Silty Clay Loam	0.5-0.6
Class IV	Sandy Clay* Clay Silty Clay	0.3-0.4

* Strong or moderate structure for all textures in this class.

This study was performed, in part, due to concerns about the adequacy of the South Carolina six-inch rule and loading rate standards. These concerns relate especially to the effect of mound development at systems installed with six inch separation. Effluent discharged from an absorption trench results in the formation of a groundwater mound under the trench (Figure 1). During periods of seasonal high water table--which usually occur in winter--mound growth ($\Delta H=H-H_o$) may become great enough to flood the trench and cause any number of problems. Potential problems include reduction of the treatment efficiency of the soil, surfacing of gray water above the ground surface, direct injection of pollutants into the groundwater, and, moreover, setting the stage for major system failure. For certain soil and seasonal high water table conditions, six inches may not be sufficient separation distance and/or the loading rate allowed by the DHEC standards may be too high. This study was conducted to address these concerns and offer a graphical aid that can be used to assess mound growth and determine a minimum loading rate based on site conditions.

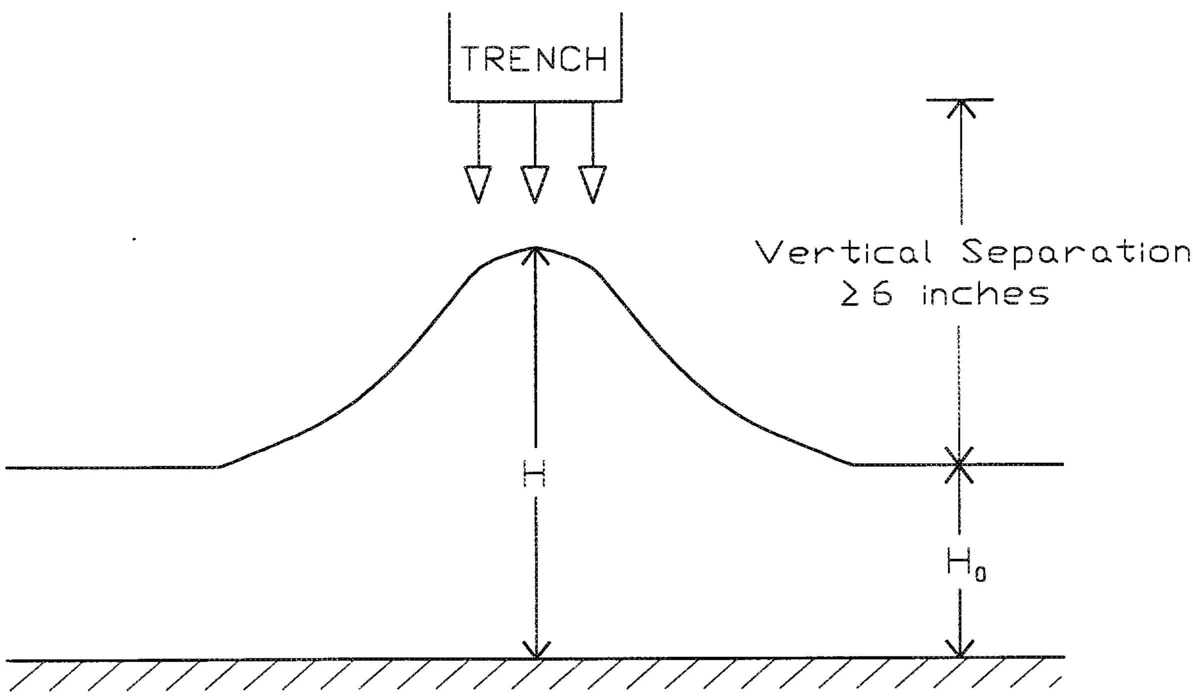

Figure 1. Groundwater Mound Growth Under an Absorption Trench

Methodology

The SWMS_2D model was used to study groundwater mound growth for many combinations of vertical separation distance, loading rate, and aquifer thickness. SWMS_2D is a computer program for modeling two-dimensional water flow and solute transport in variably saturated media (Šimunek, et al., 1994). The program uses a modified form of Richard's equation for water movement, a convection-dispersion equation for solute transport, and van Genuchten's equations for water retention and unsaturated hydraulic conductivity (van Genuchten, 1980). The Galerkin finite element method with linear basis functions is used to obtain a solution to the governing equations, subject to user imposed initial and boundary conditions.

Simulations were conducted for a seasonal high water table duration of 20 days. This time frame was chosen based on field monitoring experience and discussions with DHEC personnel. The vertical separation distances evaluated were 6, 12, 18 and 24 inches. Aquifer thicknesses included 1, 3, 5, 10 and 30 feet. Simulations were performed only for DHEC soil classes I, II and III using loading rates from the DHEC standards (Table 1). The soil hydraulic and physical parameters for each class were chosen from values reported by Rawls and Brakensiek (1989) for average soils. These values were determined from an extensive data base assembled from information on soils collected at USDA experimental watersheds across the United States. That data base includes information on soils from Coastal Plain watersheds in several Atlantic and Gulf Coast states. The validity of the USDA soil parameters was established by comparison with values determined as part of this study for soils sampled at a number of locations along the South Carolina coast.

The results of a sensitivity analysis of mound growth indicated the most significant parameters are saturated hydraulic conductivity, aquifer thickness, and loading rate (Huggins, 1996). These results are consistent with results from a similar study on mounding under recharge trenches (Hanson and Brock, 1984). One interesting outcome was that mound growth is largely insensitive to separation distance. Accordingly, a graphical design aid was developed to estimate mound growth (ΔH) in terms of hydraulic conductivity, aquifer thickness and loading rate.

Design Aid

Figure 2 is the design aid. Groundwater mound growth (ΔH) in inches is plotted on the ordinate against the dimensionless ratio of loading rate and soil saturated hydraulic conductivity (LR/K) on the abscissa. This plot contains a family of five curves corresponding to aquifer thicknesses of 1, 3, 5, 10, and 30 feet, respectively. Mound growth equal to six inches is indicated by the darker, horizontal line. Values above this line indicate mound growth in excess of six inches, while values below the line indicate mound growth less than six inches.

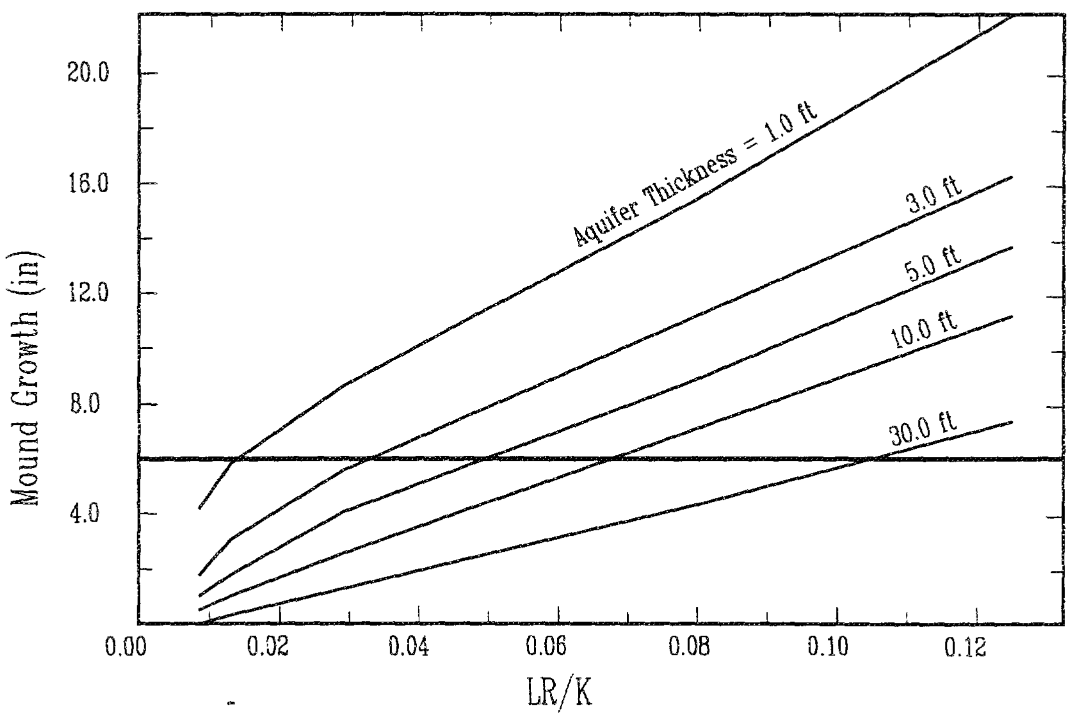

Figure 2. Design Aid to Predict Groundwater Mound Growth or Loading Rate

The plotted curves are valid for LR/K values from 0.01 to 0.12, aquifer thicknesses from 1 to 30 feet, and horizontal to near horizontal aquifer slopes, i.e., aquifers with very flat gradients. For LR/K values less than approximately 0.03, the curves are nonlinear, and for aquifer thicknesses 3 feet or greater, the mound growth is less than 6 inches. Beyond LR/K=0.03, the curves become more linear and mounding growth greater than 6 inches extends beyond the shallower aquifers.

Recognizing that with many applications LR/K may be greater than 0.12 and it would be nice to have some means to extrapolate the mounding growth curves, regression equations were developed using data for that portion of each curve where LR/K≥0.03. These equations are given in Table 2; each had a correlation coefficient greater than 0.99. These equations can be used to estimate mounding growth when LR/K exceeds the scale of Figure 2.

Table 2
Equations for Mound Growth (ΔH) in Inches for LR/K Greater Than 0.03

Aquifer Thickness (feet)	Equation
1.0	$\Delta H = 4.96 + 134.24\frac{LR}{K}$
3.0	$\Delta H = 1.57 + 166.72\frac{LR}{K} - 550.97(\frac{LR}{K})^2$
5.0	$\Delta H = 2.28 + 74.29\frac{LR}{K} + 132.88(\frac{LR}{K})^2$
10.0	$\Delta H = 0.67 + 74.06\frac{LR}{K} + 83.20(\frac{LR}{K})^2$
30.0	$\Delta H = 0.16 + 49.45\frac{LR}{K} + 76.65(\frac{LR}{K})^2$

Figure 2 and the equations in Table 2 can be used as a design aid to estimate possible mound growth for a proposed system or to specify a loading rate that will not violate the six-inch rule (or other specified separation distance). They also can be used as a tool to assess site suitability for septic tank absorption trench placement and to evaluate the performance of an existing system. To determine possible mound growth over a surficial aquifer of known thickness, first determine the value of LR/K. If the value is less than 0.12, use Figure 2. Locate the value of LR/K on the abscissa and project vertically to an intersection with the curve (or interpolated curve) corresponding to the known aquifer thickness. From there, project horizontally to the ordinate and read the mound growth in inches. If the value of

LR/K is greater than 0.12, use the appropriate equation from Table 2 to compute mound growth.

To determine a loading rate that will not violate the six-inch rule, follow the six inch line horizontally until it intersects the appropriate aquifer thickness curve. Project vertically downward to the abscissa and read the value of LR/K. These values also are reported in Table 3. Multiply this value by the soil saturated hydraulic conductivity to obtain the maximum allowable loading rate. Values of hydraulic conductivity can be determined from Figure 3 or Appendix A.

Table 3
Values of LR/K for Mounding Depth of Six Inches

Aquifer Thickness (feet)	Critical LR/K Value
1.0	0.013
3.0	0.033
5.0	0.046
10.0	0.066
30.0	0.104

Saturated Hydraulic Conductivity

Figure 3 is a U.S. Department of Agriculture (USDA) soil texture triangle onto which lines of equal saturated hydraulic conductivity (K) have been drawn. This figure was adapted from the original presented by Rawls and Brakensiek (1989), who estimated values for K using regression equations devised by the USDA to predict Green and Ampt infiltration parameters from soil texture and other soil physical characteristics. Those equations were developed during an extensive analysis of soil water data for several thousand soils sampled at experimental watersheds across the United States (Brakensiek and Rawls, 1983). That data set includes information for soils from watersheds located in the coastal plain regions of South Carolina, North Carolina, Georgia, Florida, Mississippi, and Texas. Figure 3 is provided as a resource to estimate soil saturated hydraulic conductivity in terms of primary particle composition (%sand and %clay) or according to soil textural class.

Appendix A provides profile, texture, and, most importantly, saturated hydraulic conductivity information for 105 soils occurring in the coastal counties of South Carolina. The data in Appendix A was developed from soils information available from the USDA Natural Resources Conservation Service (NRCS, formerly SCS) and published in their county soil surveys. The NRCS data includes soil name, typical profile description to a depth of approximately six feet, and low and high percentages of sand and clay. The percentages of

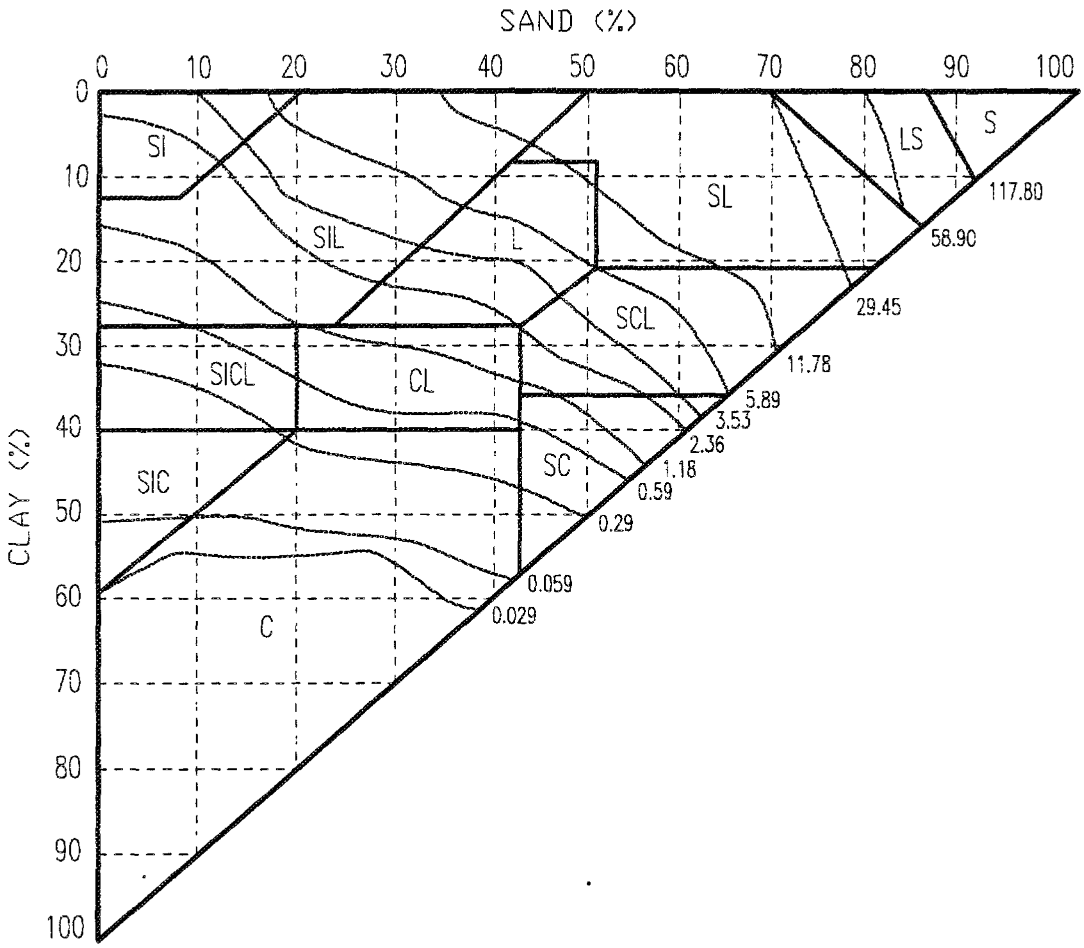

Figure 3. Soil Saturated Hydraulic Conductivity (gpd/ft^2)

sand and clay reported in Appendix A were estimated by taking an average of the low and high percentages of sand and clay, and then calculating the amount of silt (%silt=100-%sand-%clay). This was done using a BASIC computer program developed by personnel with the South Carolina Land Resources Conservation Commission (LRC). That program was extended by researchers at the University of South Carolina to classify each soil layer according to the USDA textural triangle. The soil hydraulic conductivity was obtained from Figure 3 based on the average percentages of sand and clay.

As further explanation, consider Table 4 which contains the data for the first soil series shown in Appendix A. The first column lists the soil series by name as found in the county soil survey. The second column contains a soil depth range, i.e., depths at the top and bottom of each soil layer. Multiple listings are given for a soil layer if that soil had been sampled and classified at more than one location, and there were differences in the primary particle composition and/or textural classification. The next three columns list the average primary particle composition. The last two columns give the textural classification and saturated hydraulic conductivity for each layer. Although not shown in Table 4, for some sands the hydraulic conductivity exceeded the maximum value shown on Figure 3 and is reported as >117.80 gpd/ft^2.

To use this appendix, one first must identify the site soil(s) from the appropriate county soil survey. Once the soil name(s) is know, locate it in Appendix A and read the appropriate information for the layer or layers of interest.

Table 4
Example of Soils Information Listed in Appendix A

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
ALBANY	0 - 48	85.0	9.5	5.5	Loamy Sand	82.46
	0 - 48	82.0	12.5	5.5	Loamy Sand	58.90
	48 - 56	74.0	15.5	10.5	Sandy Loam	35.34
	56 - 88	65.0	11.0	24.0	Sandy Clay Loam	10.31

Example Problems

Example problems are provided which illustrate use of the design aid and resource material to determine a loading rate that does violate the six-inch rule and evaluate the performance of an existing system, both under the assumption of a single layered or homogeneous soil, and analyze an existing system constructed in layered soils.

Example 1. Determination of Loading Rate

The owner of a recently purchased lot applies to DHEC for a permit to install a conventional septic tank and absorption trench system. DHEC personnel visited the site and performed soil borings to evaluate the site soils and look for mottles which indicates the seasonal high water table. The site soil was classified as silt loam, which is a Class III soil according to the DHEC Soil Texture Loading Rate Standards. It was estimated the sand and clay contents are about 30% and 20%, respectively. Mottles were detected at a depth of 30 inches, and it is known from well logs and discussions with local drillers that the surficial aquifer is about 30 feet thick. Determine the allowable loading rate for this system to not violate the six-inch rule. In other words, it is proposed to install the absorption trenches to a depth of 24 inches, such that the separation distance between the bottom of the trenches and the seasonal high water table is 6 inches. A loading rate must be used which will insure mound growth does not exceed 6 inches.

Solution

This problem involves determining the critical value for LR/K from Figure 2 or Table 3, and soil saturated hydraulic conductivity (K) from Figure 3. The maximum allowable loading rate is obtained by multiplying the critical value of LR/K by K.

Use Figure 2 to determine the critical value of LR/K. Follow the horizontal line corresponding to mound growth of 6 inches until it intersects the curve for aquifer thickness equal to 30 feet. Project to the abscissa and read LR/K=0.104. Alternately, this value could have been determined from Table 3.

Use Figure 3 to find a value for K. Locate the region for silt loam (SiL). Locate the percentages of sand (30%) and clay (20%) on the respective axes, project to their intersection, and read the hydraulic conductivity value from the contour line(s). Note: if the intersection occurs between two contour lines, interpolate linearly; otherwise, read the value from the contour line at the point of intersection for percentages sand and clay. For this example, the intersection occurs almost midway between the contour lines for K=2.36 gpd/ft^2 and K=3.53 gpd/ft^2. Compute the average value for K.

$$K = \frac{2.36 + 3.53}{2} = 2.95 \cdot gpd / ft^2$$

Using this value, compute the maximum allowable loading rate as

$$LR = (0.104)(2.95) = 0.31 \cdot gpd / ft^2$$

which is roughly one-half the loading rate value that would have been chosen based on the DHEC Soil Texture Loading Rate Standards (Table 1) for this soil type. For this application, a system with 6-inch separation between the trench bottom and seasonal high water table, designed according to the DHEC Loading Rate Standards, can be expected to violate the six-inch rule.

Example 2. Analysis of an Existing System

The owner of an existing septic tank system has complained about problems including sluggish house drains and odors from the absorption field. DHEC records indicate this system was approved for a loading rate of 0.8 gpd/ft^2 and was installed with the bottom of the trench at 15 inches below ground surface. An onsite investigation revealed damp soils at the ground surface and a creek adjacent to the property. The water level in the creek is only about 3 feet below ground level. A borehole was hand augered to determine the type of soil underlying the trench, to detect the seasonal high water table elevation, and to determine the thickness of the local surficial aquifer. The soil immediately under the trench is sandy clay loam transitioning to clay at a depth of 36 inches below ground surface. Gray mottles were detected near the bottom of the trench and red mottles were encountered at a depth of 20 inches below ground surface (5 inches below trench bottom). Determine if this system is having a problem with groundwater mounding.

Solution

This problem involves determining the possible groundwater mound growth ($\Delta H = H - H_o$). The loading rate (LR) is known, but not the soil hydraulic conductivity (K) and aquifer depth. These must be estimated using the available information and published data. Hydraulic conductivity can be estimated using Figure 3, which relates hydraulic conductivity to soil texture based on the USDA Soil Textural Triangle. The soil is sandy clay loam (SCL). As seen in Figure 3, the hydraulic conductivity for SCL ranges approximately from 1.18 to 29.45 gpd/ft^2. The corresponding LR/K value ranges from a low of

$$\frac{LR}{K} = \frac{0.8}{29.45} = 0.027$$

to a high of

$$\frac{LR}{K} = \frac{0.8}{1.18} = 0.677$$

Although the depth of the local aquifer was not determined, because the underlying soil is clay, it is recommended the aquifer thickness be chosen as the difference between the elevations of the red mottles and the top of the clay layer, since this system most probably supports a perched water table during the wet season. Therefore, choose the aquifer thickness as 36-20=16 inches (1.25 feet). When using the design aid, interpolate between the curves for aquifer thickness of 1.0 ft and 3.0 ft.

The worst case situation is for LR/K=0.677, which is beyond the scale of the design aid and therefore requires use of the appropriate equations in Table 2.

For an aquifer thickness of 1.0 foot

$$\Delta H = 4.96 + 134.24\frac{LR}{K}$$

$$\Delta H = 4.96 + 134.24(0.677) = 95.8 \cdot inches$$

and for an aquifer thickness of 3.0 feet

$$\Delta H = 1.57 + 166.72\frac{LR}{K} - 550.97(\frac{LR}{K})^2$$

$$\Delta H = 1.57 + 166.72(0.677) - 550.97(0.677)^2 = 17.3 \cdot inches$$

Interpolating linearly for ΔH when aquifer thickness is 1.25 feet

$$\Delta H = 95.8 + \frac{17.3 - 95.8}{3.0 - 1.0}(1.25 - 1.0) = 86.0 \cdot inches$$

If this situation occurs, the resulting groundwater mound would flood the absorption field and water would appear above the ground surface.

The best case situation is for LR/K=0.027. From Figure 2, read mound height just shy of 8 inches. The depth below ground surface to the groundwater mound is 12 inches. This is determined by subtracting the mound height (8 inches) from the depth to the red mottles (20 inches). The groundwater mound, therefore, will be 3 inches above the bottom of the absorption trench, implying the system indeed is having a problem with groundwater mounding--a problem which can explain the sluggish house drains and odors from the absorption field.

Example Problem for Layered Soils

The previous examples assumed the soil was homogeneous, implying constant physical and hydraulic properties over the length (depth) of the soil column under consideration. This is rarely the case, particularly in undisturbed unconsolidated alluvial materials where there may be several layers of different thickness and texture. Groundwater mounding under septic tank absorption trenches therefore may occur across several soil layers, each with different thickness and hydraulic conductivity. Although the design aid was developed from data generated for homogeneous soils, it can be applied to nonhomogeneous soils using an effective hydraulic conductivity determined with the following formula (Todd, 1980).

$$K_e = \frac{\Sigma z_i}{\Sigma \frac{z_i}{K_i}}$$

where K_e is the effective hydraulic conductivity (L/T), z_i is the thickness of soil layer i (L), and K_i is the hydraulic conductivity for soil layer i (L/T). The following example illustrates application of the design aid to layered soils.

Example 3. Layered Soils

A septic tank system is proposed for a new house to be constructed on a 1 acre lot in Charleston County, SC. From the Charleston County Soil Survey, it is learned the site soils are Seagate. An onsite investigation confirms the soils conform to the soil survey, and that the seasonal high water table occurs 45 inches below ground surface based on the presence of mottling. It was not possible to establish the thickness of the local aquifer by hand augering or from information on local wells. Determine if a septic tank system with maximum trench depth of 24 inches and a loading rate of 0.6 gpd/ft^2 will perform safely at this site?

Solution

This problem requires determining if the possible mound development will exceed the allowable separation distance between the proposed bottom of trench elevation and the seasonal high water table elevation. The distance is 21 inches.

First, locate Seagate soil in Appendix A. Profile information is provided to a depth of 64 inches. Beneath the proposed trench bottom there are four layers, varying texturally from loamy sand in the top layer to clay loam in the bottom layer. The soil profile from 24 to 64 inches (length of soil column under consideration) is summarized in the following table.

Depth (inches)	Texture	Hydraulic Conductivity, K (gpd/ft^2)
24-28	Loamy Sand	64.79
28-36	Sand	117.80
36-40	Sandy Clay Loam	16.20
40-64	Clay Loam	1.12

Determine the effective hydraulic conductivity using the equation

$$K_e = \frac{\Sigma z_i}{\Sigma \frac{z_i}{K_i}}$$

There are four layers of thickness z_1 = 4 inches, z_2 = 8 inches, z_3 = 4 inches, and z_4 = 24 inches, respectively. The hydraulic conductivities are K_1 = 64.79 gpd/ft^2, K_2 = 117.80 gpd/ft^2, K_3 = 16.20 gpd/ft^2, and K_4 = 1.12 gpd/ft^2 Substitute these values into the equation and solve for K_e.

$$K_e = \frac{z_1 + z_2 + z_3 + z_4}{\frac{z_1}{K_1} + \frac{z_2}{K_2} + \frac{z_3}{K_3} + \frac{z_4}{K_4}} = \frac{4 + 8 + 4 + 24}{\frac{4}{64.79} + \frac{8}{117.80} + \frac{4}{16.20} + \frac{24}{1.12}} = 1.83 \cdot gpd / ft^2$$

Note: This example illustrates the impact of a lower lying soil layer with slower hydraulic conductivity on the hydraulic properties of the soil column, and therefore, on groundwater mound development.

Next divide loading rate by the effective hydraulic conductivity to determine the dimensionless loading rate parameter.

$$\frac{LR}{K} = \frac{0.6}{1.83} = 0.33$$

This value exceeds the scale of the design aid nomograph, so use the appropriate equation from Table 2. Since the aquifer thickness is unknown, this presents a problem about which equation to choose. A recommended approach is to evaluate mound growth for different aquifer thicknesses to determine the thickness at which mound growth violates the allowable separation distance. Depending on the outcome, additional onsite investigations may be required to establish the aquifer thickness.

Following the recommended approach, first evaluate mound growth for the greatest aquifer thickness, i.e., 30 feet.

$$\Delta H = 0.16 + 49.45\frac{LR}{K} + 76.65(\frac{LR}{K})^2$$

Substitute for LR/K

$$\Delta H = 0.16 + 49.45(0.33) + 76.65(0.33)^2$$

and solve for ΔH.

$$\Delta H = 24.8 \cdot inches$$

This value is greater than the allowable separation distance between the proposed trench bottom and the seasonal high water table. Knowing that mound growth is greater with lesser aquifer thicknesses, it is not necessary to evaluate other equations. Based on this outcome, the system is not expected to perform safely and should not be constructed as proposed.

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APPENDIX A
PROFILE, TEXTURE AND HYDRAULIC CONDUCTIVITY INFORMATION FOR SOUTH CAROLINA COASTAL COUNTY SOILS

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
ALBANY	0 - 48	85	9.5	5.5	Loamy Sand	82.46
	0 - 48	82	12.5	5.5	Loamy Sand	58.90
	48 - 56	74	15.5	10.5	Sandy Loam	35.34
	56 - 88	65	11	24	Sandy Clay Loam	10.31
ALPIN	3 - 54	87.5	8.5	4	Sand	117.80
	54 - 99	84.5	9	6.5	Loamy Sand	91.30
ARGENT	5 - 64	23.5	29	47.5	Clay	0.21
	64 - 76	40	30	30	Clay Loam	1.77
BARATARI	0 - 11	92	4.5	3.5	Sand	>117.80
	11 - 20	91.5	3.5	5	Sand	>117.80
	20 - 55	93	3.5	3.5	Sand	>117.80
	55 - 80	91.5	3.5	5	Sand	>117.80
BAYBORO	0 - 14	57.5	32.5	10	Sandy Loam	15.31
	0 - 14	30	47.5	22.5	Loam	2.36
	0 - 14	48	38	14	Loam	8.84
	14 - 64	25	27.5	47.5	Clay	0.24
BERTIE	0 - 17	75	15	10	Sandy Loam	36.82
	0 - 17	62.5	22.5	15	Sandy Loam	16.19
	17 - 42	60	13.5	26.5	Sandy Clay Loam	5.89
	42 - 57	62.5	17.5	20	Sandy Clay Loam	10.90
	57 - 85	72.5	17.5	10	Sandy Loam	29.45
BETHERA	0 - 7	52.5	35	12.5	Sandy Loam	11.78
	0 - 7	32.5	52.5	15	Silt Loam	4.71
	0 - 7	25	44	31	Clay Loam	1.04
	7 - 68	25	32.5	42.5	Clay	0.35
	68 - 80	27	38	35	Clay Loam	0.82
BLADEN	0 - 14	65	20	15	Sandy Loam	18.29
	0 - 14	29.5	49.5	21	Loam	2.92

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
BLANTON	0 - 58	87.5	8.5	4	Sand	117.80
	0 - 58	81	10	9	Loamy Sand	55.96
	0 - 58	92.5	3.5	4	Sand	>117.80
	58 - 62	78.5	7.5	14	Sandy Loam	47.12
	62 - 80	62.5	11.5	26	Sandy Clay Loam	7.66
BOHICKET	0 - 10	10	45	45	Silty Clay	0.13
	0 - 10	10	56.5	33.5	Silty Clay Loam	0.42
	10 - 49	17.5	35	47.5	Clay	0.15
BONNEAU	0 - 22	75	15	10	Sandy Loam	35.31
	0 - 22	86	9	5	Loamy Sand	88.35
	22 - 50	60	16	24	Sandy Clay Loam	7.95
	50 - 74	57.5	15	27.5	Sandy Clay Loam	5.15
BROOKMAN	0 - 15	34	48.5	17.5	Loam	2.86
	0 - 15	34	51	15	Silt Loam	4.70
	15 - 58	27	28	45	Clay	0.29
	58 - 65	33.5	29	37.5	Clay Loam	0.80
BUNCOMBE	0 - 10	80.5	12	7.5	Loamy Sand	53.52
	10 - 55	80.5	12	7.5	Loamy Sand	53.01
BYARS	0 - 13	50	35	15	Loam	8.83
	0 - 13	17.5	57.5	25	Silt Loam	1.16
	0 - 13	17.5	57.5	25	Silt Loam	1.16
	13 - 43	22.5	30	47.5	Clay	0.21
	43 - 73	13.5	39	47.5	Clay	0.12
CAINHOY	0 - 55	88.5	3	8.5	Loamy Sand	106.02
	55 - 99	93.5	1	5.5	Sand	>117.80
CAPEFE	0 - 16	25	65	10	Silt Loam	4.74
	0 - 16	57	33	10	Sandy Loam	15.30
	16 - 52	27.5	25	47.5	Clay	0.24
CAPERS	0 - 16	12.5	45	42.5	Silty Clay	0.19
	0 - 16	15	60	25	Silt Loam	1.18
CAROLINE	0 - 9	57.5	27.5	15	Sandy Loam	14.09
	0 - 9	25	55	20	Silt Loam	2.82
	0 - 9	27.5	37.5	35	Clay Loam	0.87
	9 - 84	25	30	45	Clay	0.29
	84 - 99	37.5	32.5	30	Clay Loam	1.77

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
CENTENARY	0 - 9	93	2.5	4.5	Sand	>117.80
	9 - 58	88	7.5	4.5	Sand	117.80
	58 - 72	88.5	5.5	6	Sand	58.90
CHARLESTON	0 - 16	85	9	6	Loamy Sand	88.52
	0 - 16	65	23.5	11.5	Sandy Loam	20.62
	16 - 44	62.5	23.5	14	Sandy Loam	17.67
	44 - 80	85	6.5	8.5	Loamy Sand	85.41
CHASTAIN	5 - 52	8.5	44	47.5	Silty Clay	0.15
	52 - 72	85.5	8.5	6	Loamy Sand	94.24
CHIPLEY	0 - 6	91	6	3	Sand	>117.80
	6 - 77	91	5	4	Sand	>117.80
CHISOLM	0 - 25	81	10.5	8.5	Loamy Sand	73.63
	0 - 25	87.5	6.5	6	Loamy Sand	106.02
	25 - 36	54.5	19	26.5	Sandy Clay Loam	5.01
	36 - 45	47	20.5	32.5	Sandy Clay Loam	2.24
	45 - 57	63	12	25	Sandy Clay Loam	8.54
	57 - 80	85	4	11	Loamy Sand	82.46
COOSAW	0 - 32	85	9	6	Loamy Sand	82.46
	0 - 32	77.5	14	8.5	Sandy Loam	42.70
	32 - 35	70	12.5	17.5	Sandy Loam	21.20
	35 - 72	62.5	11	26.5	Sandy Clay Loam	7.95
	72 - 99	75	19	6	Sandy Loam	53.01
COXVILLE	0 - 11	39.5	44.5	16	Loam	5.76
	11 - 72	32.5	20	47.5	Clay	0.24
CRAVEN	0 - 9	32.5	50.5	17	Silt Loam	4.42
	0 - 9	23.5	43	33.5	Clay Loam	0.82
	9 - 54	18.5	34	47.5	Clay	0.18
	54 - 80	68	12	20	Sandy Clay Loam	16.20
CREVASSE	0 - 10	87.5	7.5	5	Loamy Sand	98.17
	0 - 10	77.5	14	8.5	Sandy Loam	57.15
	10 - 60	87.5	7.5	5	Loamy Sand	108.97
DAWHOO	0 - 30	77.5	19	3.5	Loamy Sand	45.65
	30 - 60	80	14.5	5.5	Loamy Sand	53.01

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
DELOSS	0 - 18	72.5	18.5	9	Sandy Loam	34.81
	0 - 18	52.5	35	12.5	Sandy Loam	11.78
	0 - 18	52.5	35	12.5	Sandy Loam	11.78
	18 - 56	47	26.5	26.5	Sandy Clay Loam	3.24
DOTHAN	0 - 13	78.5	11.5	10	Sandy Loam	56.96
	0 - 13	70	16	14	Sandy Loam	22.82
	0 - 13	80	14.5	5.5	Loamy Sand	51.54
	13 - 33	64	9.5	26.5	Sandy Clay Loam	9.42
	33 - 60	58.5	12.5	29	Sandy Clay Loam	5.01
DUNBAR	0 - 8	65	19	16	Sandy Loam	16.69
	0 - 8	80	7.5	12.5	Sandy Loam	44.18
DUPLIN	0 - 8	65.5	23.5	11	Sandy Loam	20.82
	0 - 8	80	7.5	12.5	Sandy Loam	44.18
ECHAW	5 - 40	82.5	11.5	6	Loamy Sand	64.79
	40 - 50	87.5	6.5	6	Loamy Sand	111.91
	50 - 65	82.5	11.5	6	Loamy Sand	88.35
EDDINGS	0 - 44	82.5	12	5.5	Loamy Sand	64.79
	44 - 66	62.5	17.5	20	Sandy Clay Loam	9.72
	66 - 84	49.5	23	27.5	Sandy Clay Loam	3.68
EDISTO	0 - 14	72.5	21.5	6	Sandy Loam	34.36
	0 - 14	62.5	25	12.5	Sandy Loam	17.61
	14 - 27	62.5	23.5	14	Sandy Loam	16.49
	27 - 36	67.5	21	11.5	Sandy Loam	22.38
	36 - 70	52	30.5	17.5	Sandy Loam	9.13
	70 - 84	87.5	6.5	6	Loamy Sand	111.91
EMPORIA	0 - 15	55	32.5	12.5	Sandy Loam	13.55
	0 - 15	72.5	20	7.5	Sandy Loam	29.45
	15 - 32	52.5	21	26.5	Sandy Clay Loam	4.71
	32 - 57	45	24.5	30.5	Clay Loam	2.30
	57 - 70	60	17.5	22.5	Sandy Clay Loam	8.84
EULONIA	0 - 13	73.5	16.5	10	Sandy Loam	29.45
	0 - 13	60	27.5	12.5	Sandy Loam	16.02
	13 - 48	37.5	22.5	40	Clay Loam	0.53
	48 - 58	66	9	25	Sandy Clay Loam	10.01

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
FACEVILLE	5 - 11	44	28	28	Clay Loam	2.86
	11 - 72	41.5	13.5	45	Clay	0.38
FLUVAQUENTS	0 - 6	91.5	1.5	7	Sand	>117.80
	0 - 6	35	55	10	Silt Loam	7.85
	6 - 20	78.5	16	5.5	Loamy Sand	44.18
	20 - 60	65	25	10	Sandy Loam	20.62
FRIPP	5 - 80	97.5	0	2.5	Sand	>117.80
GOLDSBORO	0 - 15	70	20	10	Sandy Loam	25.03
	0 - 15	78.5	16.5	5	Loamy Sand	44.18
	15 - 45	60	16	24	Sandy Clay Loam	7.66
	45 - 65	47	26	27	Sandy Clay Loam	3.12
GRIFTON	0 - 15	67.5	20	12.5	Sandy Loam	20.62
	0 - 15	76.5	17.5	6	Loamy Sand	41.72
	15 - 40	54.5	19	26.5	Sandy Clay Loam	4.86
	40 - 58	71.5	18.5	10	Sandy Loam	27.09
HOBCAW	0 - 18	72.5	18.5	9	Sandy Loam	29.21
	0 - 18	52.5	35	12.5	Sandy Loam	11.75
	18 - 46	47	26.5	26.5	Sandy Clay Loam	3.30
HOCKLEY	0 - 23	57.5	28.5	14	Sandy Loam	13.91
	0 - 23	32.5	53.5	14	Silt Loam	4.71
	0 - 23	63.5	22.5	14	Sandy Loam	17.91
	23 - 50	34.5	39	26.5	Loam	2.12
	50 - 80	47	26.5	26.5	Sandy Clay Loam	3.48
JOHNSTON	0 - 30	37	50.5	12.5	Silt Loam	6.48
	0 - 30	58.5	30	11.5	Sandy Loam	15.90
	30 - 34	82.5	10.5	7	Loamy Sand	64.79
	34 - 60	63	24.5	12.5	Sandy Loam	17.67
KENANSVILLE	0 - 24	82.5	11	6.5	Loamy Sand	58.90
	0 - 24	82.5	11	6.5	Loamy Sand	58.90
	24 - 36	65	23.5	11.5	Sandy Loam	19.44
	36 - 80	82.5	12	5.5	Loamy Sand	73.63
KIAWAH	0 - 15	82	12.5	5.5	Loamy Sand	58.54
	15 - 32	77	11.5	11.5	Sandy Loam	41.23
	32 - 48	87.5	5	7.5	Loamy Sand	63.61
	48 - 72	90	4.5	5.5	Sand	>117.80

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
LAKELAND	0 - 43	91.5	3.5	5	Sand	>117.80
	43 - 80	93.5	3	3.5	Sand	>117.80
LENOIR	0 - 8	27.5	59.5	13	Silt Loam	4.71
	0 - 8	52.5	34.5	13	Sandy Loam	11.78
	8 - 75	25	27.5	47.5	Clay	0.21
LEON	3 - 15	93	5.5	1.5	Sand	>117.80
	15 - 30	88.5	6.5	5	Sand	117.80
	30 - 80	93	4.5	2.5	Sand	>117.80
LEVY	0 - 8	7.5	57.5	35	Silty Clay Loam	0.27
	0 - 8	7.5	59	33.5	Silty Clay Loam	0.36
	0 - 8	7.5	45	47.5	Silty Clay	0.11
	8 - 44	7.5	45	47.5	Silty Clay	0.15
LUCY	0 - 24	75	18.5	6.5	Sandy Loam	56.23
	0 - 24	80	14.5	5.5	Loamy Sand	53.55
	24 - 35	67.5	12.5	20	Sandy Clay Loam	16.20
	35 - 70	65	2.5	32.5	Sandy Clay Loam	7.36
LYNCHBURG	0 - 10	74	20	6	Sandy Loam	36.82
	0 - 10	60	27.5	12.5	Sandy Loam	16.02
	10 - 62	54	19.5	26.5	Sandy Clay Loam	4.71
LYNNHAVEN	0 - 16	92	6.5	1.5	Sand	>117.80
	16 - 30	87.5	7.5	5	Loamy Sand	108.97
	30 - 75	93	4.5	2.5	Sand	>117.80
MEGGETT	0 - 8	80	10	10	Sandy Loam	58.90
	0 - 8	65	22.5	12.5	Sandy Loam	19.85
	0 - 8	32.5	47.5	20	Loam	3.14
	8 - 16	29.5	25.5	45	Clay	0.24
	16 - 52	29.5	23	47.5	Clay	0.24
	52 - 65	37	25.5	37.5	Clay Loam	0.74
MURAD	0 - 49	82.5	10.5	7	Loamy Sand	61.85
	49 - 60	62.5	20	17.5	Sandy Loam	12.66
	60 - 80	49.5	21.5	29	Sandy Clay Loam	3.24
	80 - 85	75	12.5	12.5	Sandy Loam	29.74

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
MYATT	0 - 10	50	36.5	13.5	Loam	10.47
	0 - 10	25	57.5	17.5	Silt Loam	2.95
	0 - 10	75	19	6	Sandy Loam	58.85
	10 - 50	40	33.5	26.5	Loam	2.36
	50 - 72	50	31.5	18.5	Loam	7.36
NANKIN	0 - 8	65	21.5	13.5	Sandy Loam	19.89
	0 - 8	77.5	14	8.5	Sandy Loam	56.52
	0 - 8	54.5	20.5	25	Sandy Clay Loam	4.71
	8 - 13	65	10	25	Sandy Clay Loam	8.84
	13 - 38	45	12.5	42.5	Clay	0.44
	38 - 65	60	15	25	Sandy Clay Loam	7.36
NANSEMOND	0 - 8	60	29.5	10.5	Sandy Loam	16.94
	0 - 8	67.5	25.5	7	Sandy Loam	24.84
	8 - 29	60	26	14	Sandy Loam	14.73
	29 - 66	67.5	24.5	8	Sandy Loam	24.44
	66 - 70	72.5	20.5	7	Sandy Loam	29.45
NEMOURS	0 - 9	72.5	19	8.5	Sandy Loam	29.45
	0 - 9	60	26	14	Sandy Loam	14.85
	9 - 44	22.5	20	57.5	Clay	0.02
	44 - 55	47.5	25	27.5	Sandy Clay Loam	2.95
	55 - 80	62.5	18.5	19	Sandy Loam	11.04
NOBOCO	0 - 13	78.5	16.5	5	Loamy Sand	37.86
	0 - 13	76	12.5	11.5	Sandy Loam	37.48
	13 - 47	53.5	20	26.5	Sandy Clay Loam	4.56
	47 - 72	46	22.5	31.5	Sandy Clay Loam	2.24
NORFOLK	0 - 18	78.5	16.5	5	Loamy Sand	37.86
	18 - 44	57.5	16	26.5	Sandy Clay Loam	5.01
OCILLA	0 - 28	78.5	14.5	7	Loamy Sand	47.12
	0 - 28	78.5	15	6.5	Loamy Sand	48.59
	28 - 59	62.5	12.5	25	Sandy Clay Loam	8.54
	59 - 67	52	20.5	27.5	Sandy Clay Loam	4.06
OGEECHEE	0 - 8	82.5	10	7.5	Loamy Sand	57.51
	0 - 8	79	13.5	7.5	Loamy Sand	48.19
	8 - 23	52.5	20	27.5	Sandy Clay Loam	4.20
	23 - 42	46	16.5	37.5	Sandy Clay	1.06
	42 - 60	65	12.5	22.5	Sandy Clay Loam	10.90

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
OKEETEE	0 - 7	72.5	18.5	9	Sandy Loam	29.15
	0 - 7	51	36.5	12.5	Loam	10.61
	7 - 50	29.5	23	47.5	Clay	0.24
	50 - 78	34.5	30.5	35	Clay Loam	0.88
ONSLOW	0 - 17	78.5	16.5	5	Loamy Sand	37.86
	0 - 17	57.5	32.5	10	Sandy Loam	15.31
	17 - 53	57.5	17.5	25	Sandy Clay Loam	5.60
ORANGEBURG	0 - 7	79	14	7	Loamy Sand	42.18
	0 - 7	72.5	16.5	11	Sandy Loam	27.49
	0 - 7	57.5	18.5	24	Sandy Clay Loam	5.59
	7 - 12	70	17.5	12.5	Sandy Loam	23.56
	12 - 54	52	21.5	26.5	Sandy Clay Loam	4.12
	54 - 64	47.5	20	32.5	Sandy Clay Loam	2.06
OSIER	0 - 8	91.5	3	5.5	Sand	>117.80
	0 - 8	81	6.5	12.5	Sandy Loam	48.19
	8 - 48	87.5	7	5.5	Loamy Sand	106.02
	48 - 75	94	2.5	3.5	Sand	>117.80
PAMLICO	30 - 60	87.5	5	7.5	Loamy Sand	108.97
PANTEGO	0 - 18	50	40	10	Loam	12.55
	0 - 18	50	40	10	Loam	12.55
	0 - 18	77.5	15.5	7	Loamy Sand	58.90
	18 - 42	45	28.5	26.5	Loam	3.09
	42 - 65	42	28	30	Clay Loam	0.21
PAXVILLE	0 - 15	72.5	21	6.5	Sandy Loam	34.36
	0 - 15	55	28.5	16.5	Sandy Loam	11.25
	0 - 15	60	28.5	11.5	Sandy Loam	16.75
	15 - 40	55	23.5	21.5	Sandy Clay Loam	7.36
	40 - 48	80	7	13	Sandy Loam	45.65
	48 - 99	85	8	7	Loamy Sand	86.88
PELHAM	0 - 27	77.5	15	7.5	Sandy Loam	54.48
	0 - 27	82.5	13	4.5	Loamy Sand	70.68
	0 - 27	86	9.5	4.5	Loamy Sand	97.19
	27 - 56	61.5	16	22.5	Sandy Clay Loam	9.42
	56 - 68	54	18.5	27.5	Sandy Clay Loam	4.59

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
PICKNEY	0 - 34	80	14	6	Loamy Sand	53.01
	0 - 34	85	9.5	5.5	Loamy Sand	82.46
	34 - 80	86	8.5	5.5	Loamy Sand	97.19
PLUMMER	0 - 50	87.5	8.5	4	Sand	95.72
	0 - 50	80.5	14	5.5	Loamy Sand	57.43
	50 - 72	66	11.5	22.5	Sandy Clay Loam	11.49
POCOMOKE	0 - 28	65	22.5	12.5	Sandy Loam	20.62
	28 - 40	83	5.5	11.5	Loamy Sand	64.79
	40 - 60	70.5	12	17.5	Sandy Loam	22.68
POLAWANA	0 - 30	77.5	15.5	7	Loamy Sand	44.18
	30 - 80	87.5	5.5	7	Loamy Sand	111.91
PORTSMOUTH	0 - 19	52.5	30	17.5	Sandy Loam	8.84
	0 - 19	52.5	32.5	15	Sandy Loam	10.31
	0 - 19	27.5	49	23.5	Loam	2.09
	19 - 35	47	25.5	27.5	Sandy Clay Loam	2.95
	35 - 38	76	11	13	Sandy Loam	35.34
	38 - 72	86	8	6	Loamy Sand	97.19
PUNGO	72 - 84	30	22.5	47.5	Clay	0.24
QUITMAN	0 - 11	57.5	32.5	10	Sandy Loam	15.31
	0 - 11	77.5	16.5	6	Loamy Sand	44.25
	11 - 18	45	28.5	26.5	Loam	3.09
	18 - 65	47.5	26	26.5	Sandy Clay Loam	3.24
RAINS	0 - 12	55	32.5	12.5	Sandy Loam	13.55
	0 - 12	45	39.5	15.5	Loam	7.85
	12 - 40	50	23.5	26.5	Sandy Clay Loam	3.83
	40 - 62	46	25	29	Sandy Clay Loam	2.50
	62 - 79	55	15	30	Sandy Clay Loam	4.12
RIDGELAND	0 - 8	87.5	7.5	5	Loamy Sand	98.17
	8 - 15	89.5	5.5	5	Sand	>117.80
	15 - 35	91.5	3.5	5	Sand	>117.80
	35 - 80	91.5	3.5	5	Sand	>117.80
RIMINI	0 - 58	96.5	2	1.5	Sand	>117.80
	58 - 70	93.5	3.5	3	Sand	>117.80
	70 - 80	96.5	2	1.5	Sand	>117.80

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
ROSEDHU	0 - 11	92	4.5	3.5	Sand	>117.80
	11 - 25	91.5	4	4.5	Sand	>117.80
	25 - 53	93	3.5	3.5	Sand	>117.80
	53 - 70	91.5	4	4.5	Sand	>117.80
	70 - 80	93	3.5	3.5	Sand	>117.80
RUTLEGE	0 - 18	80	14	6	Loamy Sand	53.01
	0 - 18	80	14	6	Loamy Sand	53.01
	0 - 18	92.5	1.5	6	Sand	>117.80
	18 - 60	86.5	7.5	6	Loamy Sand	97.19
SANTEE	0 - 6	60	25	15	Sandy Loam	14.83
	0 - 6	34.5	41.5	24	Loam	2.07
	6 - 48	15	37.5	47.5	Clay	0.14
SCRANTON	0 - 7	74	17.5	8.5	Sandy Loam	34.36
	0 - 7	87.5	7.5	5	Loamy Sand	107.25
	7 - 41	85	7.5	7.5	Loamy Sand	76.57
	41 - 72	92	2	6	Sand	>117.80
SEABROOK	0 - 8	85	8	7	Loamy Sand	78.53
	8 - 81	85	8	7	Loamy Sand	76.57
SEAGATE	0 - 12	87.5	11	1.5	Sand	106.02
	12 - 28	82.5	11	6.5	Loamy Sand	64.79
	28 - 36	87.5	9.5	3	Sand	117.80
	36 - 40	67.5	10	22.5	Sandy Clay Loam	16.20
	40 - 64	25	45	30	Clay Loam	1.12
SEEWEE	0 - 21	87.5	8	4.5	Sand	99.25
	21 - 30	91.5	5	3.5	Sand	>117.80
	30 - 65	92	4.5	3.5	Sand	>117.80
STONO	0 - 17	60	28.5	11.5	Sandy Loam	16.25
	0 - 17	52.5	32.5	15	Sandy Loam	10.31
	17 - 37	57.5	16	26.5	Sandy Clay Loam	5.60
	37 - 54	84	9	7	Loamy Sand	79.52
SUFFOLK	0 - 11	57.5	30.5	12	Sandy Loam	14.73
	0 - 11	72.5	20.5	7	Sandy Loam	29.75
	0 - 11	35	52.5	12.5	Silt Loam	5.89
	11 - 47	50	28.5	21.5	Loam	5.74
	47 - 65	73.5	19.5	7	Sandy Loam	30.92

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
SUMMERTON	0 - 8	75	16.5	8.5	Sandy Loam	39.27
	0 - 8	55	31	14	Sandy Loam	12.52
	0 - 8	55	31	14	Sandy Loam	12.52
	8 - 72	32.5	15	52.5	Clay	0.12
TAWCAW	5 - 58	25.5	22	52.5	Clay	0.06
TOMOTLEY	0 - 13	75	19	6	Sandy Loam	58.90
	0 - 13	62.5	25	12.5	Sandy Loam	17.61
	0 - 13	25.5	58.5	16	Silt Loam	3.47
	13 - 44	50	23.5	26.5	Sandy Clay Loam	4.12
	44 - 59	47.5	22.5	30	Sandy Clay Loam	2.86
TORHUNTA	0 - 15	65.5	23	11.5	Sandy Loam	21.88
	0 - 15	65.5	23	11.5	Sandy Loam	21.88
	15 - 40	70	18.5	11.5	Sandy Loam	23.56
	40 - 80	80	10	10	Sandy Loam	58.61
UDIPSAMMENTS	0 - 60	87	5.5	7.5	Loamy Sand	94.24
UDORTHENTS	0 - 60	40	30	30	Clay Loam	1.77
WADMALAW	0 - 13	75	19	6	Sandy Loam	58.85
	0 - 13	55	32.5	12.5	Sandy Loam	13.55
	13 - 33	42.5	31	26.5	Loam	2.65
	33 - 83	29.5	38	32.5	Clay Loam	0.97
WAGRAM	0 - 24	78.5	15.5	6	Loamy Sand	44.18
	0 - 24	90	6	4	Sand	>117.80
	24 - 75	60	17.5	22.5	Sandy Clay Loam	8.54
WAHEE	0 - 11	60	27.5	12.5	Sandy Loam	16.02
	0 - 11	37	44.5	18.5	Loam	4.20
	11 - 56	28.5	24	47.5	Clay	0.21
WAKULLA	0 - 24	87.5	7.5	5	Loamy Sand	112.00
	0 - 24	91	1.5	7.5	Sand	>117.80
	24 - 42	82.5	12.5	5	Loamy Sand	73.63
	42 - 80	90.5	4.5	5	Sand	>117.80
WANDO	0 - 51	85	6.5	8.5	Loamy Sand	76.57
	51 - 72	89	5.5	5.5	Sand	>117.80

SOIL SERIES	DEPTH (inches)	%SAND	%SILT	%CLAY	TEXTURE	K (gpd/ft^2)
WICKSBURG	0 - 26	93	2.5	4.5	Sand	>117.80
	0 - 26	75	17	8	Sandy Loam	36.81
	0 - 26	86	9	5	Loamy Sand	88.35
	26 - 30	42	25.5	32.5	Clay Loam	1.62
	30 - 65	27.5	32.5	40	Clay Loam	1.41
WILLIMAN	0 - 26	72.5	20.5	7	Sandy Loam	29.45
	0 - 26	90	6	4	Sand	>117.80
	26 - 80	52.5	17.5	30	Sandy Clay Loam	3.42
WITHERBEE	0 - 25	90	7	3	Sand	>117.80
	25 - 99	91	4.5	4.5	Sand	>117.80
WOODINGTON	0 - 12	68	26	6	Sandy Loam	25.61
	0 - 12	65	23.5	11.5	Sandy Loam	21.25
	12 - 47	65	23.5	11.5	Sandy Loam	20.62
	47 - 85	70	19.5	10.5	Sandy Loam	23.85
YAUHANNAH	0 - 9	75	15	10	Sandy Loam	37.48
	0 - 9	62.5	22.5	15	Sandy Loam	16.19
	9 - 52	60	13.5	26.5	Sandy Clay Loam	6.48
	52 - 62	62.5	17.5	20	Sandy Clay Loam	10.60
	62 - 75	72.5	17.5	10	Sandy Loam	28.27
YEMASSEE	0 - 12	75	15	10	Sandy Loam	37.48
	0 - 12	62.5	22.5	15	Sandy Loam	16.19
	12 - 50	50	23.5	26.5	Sandy Clay Loam	3.83
	50 - 75	60	14	26	Sandy Clay Loam	5.89
YONGES	0 - 14	60	28.5	11.5	Sandy Loam	16.25
	0 - 14	52.5	32.5	15	Sandy Loam	10.31
	14 - 42	45	26	29	Clay Loam	2.36
	42 - 60	47.5	30	22.5	Loam	4.83